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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/268,948	03/16/99	TAKAHASHI	M

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EXAMINER

CANTELMO, G

ART UNIT

PAPER NUMBER

1753

DATE MAILED:

02/22/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/268,948

Applicant(s)
Takahashi

Examiner
Gregg Cantelmo

Group Art Unit
1753



- ☐ Responsive to communication(s) filed on _____
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

- ☒ Claim(s) 1, 2, 10, and 11 is/are pending in the application
- Of the above, claim(s) _____ is/are withdrawn from consideration
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1, 2, 10, and 11 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☒ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The following title is suggested: Iron Nitride Film Having a Nitrogen Martensite α' Phase with α (200) Surface.
3. The disclosure is objected to because of the following informalities: the application which claims priority to copending U.S. application serial No. 08/765,836 must contain a specific reference to the prior application(s) in the first sentence of the specification (37 CFR 1.78). Appropriate correction is required.

Priority

4. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification (37 CFR 1.78).

Drawings

5. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

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Claim Objections

6. Claims 1 and 2 are objected to because of the following informalities: these claims with respect to all limitations given patentable weight are held to be identical with respect to the film formed. The method of forming the film is not germane to the issue of patentability of the film itself. Therefore the limitation of alternating DC sputtering has not been given patentable weight. Under that basis, claims 1 and 2, regardless of the mode of sputtering which is not germane to the film formed are not patentably distinct. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-2 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al. "Synthesis of Fe₁₆N₂ films by using a reactive plasma" (1993) hereafter referred to as Takahashi 1993.

Therein Takahashi 1993 discloses forming Fe-N onto a MgO substrate films using a facing (otherwise understood as opposing) target type DC sputtering apparatus (page 3040, second column and page 3041 first column). The process is performed under identical plasma conditions

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T_e is within a range of about 0.2 eV and 0.6 eV and N_e is about 10^9 cm⁻³. The result was an Fe-N sputtered film wherein only diffracted line of (002) from α' is observed (page 3041, second column). Since the opposed DC sputtering is performed under the same plasma conditions the film formed will inherently have the same properties. The structure of the film will be an α' -Fe₁₆N₂ single phase (page 3041, column 1 as applied to instant claims 1 and 10-11).

The method of forming the film is not germane to the issue of patentability of the film itself. Therefore the limitation of alternating DC sputtering has not been given patentable weight (as applied to instant claim 2).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-2 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by A.

Kano et al., "Metastable Fe Nitrides with High Bs Prepared by Reactive Sputtering", J. Appl. Phys. 53(11), Nov. 1982, pp 8332-8334 (hereafter referred to as Kano).

Kano discloses of a magnetic thin film manufacturing method comprising: introducing argon and nitrogen into a chamber holding a substrate (page 8332, under the subheading "Experimental Procedure" lines 1-7); applying DC power to an iron target in the atmosphere

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(page 8332, second column, lines 9-12). Furthermore the substrate temperature is less than 200 degrees Celsius (page 8332, second column, lines 5-8). Therefore, since the substrate temperature is below 200 degrees Celsius and the iron target is sputtered in an argon and nitrogen atmosphere via DC power, Kano will inherently generate the same nitrogen martensite α' phase. The nitrogen gas flow percentage is within the claimed range of 1- to 25 % (Fig. 1). The presence of an α Fe film is taught (page 8333, lines 45-47). Kano also teaches of heat treating the film (page 8333, lines 28-36; Fig. 4).

It is also clear that Kano teaches that, with respect to a Fe_{16}N_2 film, it is inherent that the temperature be below 200 degrees Celsius to prevent the film from decomposing (page 8333, lines 41-47). Furthermore, since Kano discloses the importance of the Fe_{16}N_2 film (page 8332, under subheading "Introduction", lines 13-15) and that temperatures above 200 are undesirable due to the adverse effects such a temperature range would have on a Fe_{16}N_2 film, and that the instant application employs the same process conditions to obtain a desired crystalline phase, Kano will inherently generate the same crystalline phase.

Kano discloses of the electron voltage range of the instant claims (page 8332, second column, lines 11-12). By varying the electron voltage, the density of the electrons will vary in direct relation to the electron voltage variance. Having disclosed such a range, it is the examiner's position that the electron voltage range of Kano will generate a range of electron densities which will overlap or encompass the instantly claimed electron density range. Having such an overlap would obviously generate the same film as that claimed in the instant application.

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Therefore it is expected that since the Fe_{16}N_2 is formed under the same conditions as the instant application, the resultant film will have the same crystal orientation.

The method of forming the film is not germane to the issue of patentability of the film itself. Therefore the limitation of alternating DC sputtering has not been given patentable weight (as applied to instant claim 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the process of Kano by selecting the desired electron density range since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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12. Claims 1-2 and 10-11 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3-20 of copending Application No. 08/765,836. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method of copending application No. 08/765,836 will obviously if not inherently generate the same film claimed in the instant application. This is evident since the conditions recited in the copending application are identical to those in the instant application required to generate the claimed film.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.


Conclusion

13. In the event that applicant amends the claims, it is respectfully requested that applicant point out where and/or how the originally filed disclosure supports the amendment(s) (i.e., page(s) and line(s); figure(s); etc.). By doing so, the examiner can clearly locate such support and reduce the probability of new matter rejections.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on (703) 308-3322. FAX communications should be sent to the appropriate FAX

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number: (703) 305-3599 for After Final Responses only; (703) 305-7718 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



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SUPERVISORY PATENT EXAMINER
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February 16, 2000